

CLAIMS

1-47. Canceled

48. (Currently Amended) An expandable medical device comprising:  
a plurality of elongated beams, the plurality of elongated beams joined together to form a substantially cylindrical device which is expandable from a cylinder having a first diameter to a cylinder having a second diameter, the plurality of elongated beams having a beam width in a circumferential direction and wherein adjacent elongated beams form V-shapes when the cylinder is at the second diameter;

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S, a plurality of hinges connecting the elongated beams having a hinge width, wherein the hinge width is smaller than the beam width, wherein the plurality of hinges ~~each have a first end connected to a first of the elongated beams and a second end connected to a second of the elongated beams, the hinges being tapered from the first end to the second end~~ are each tapered such that an end of each hinge closer to an apex of the V-shapes formed by the adjacent elongated beams has a width which is greater than a width of the hinge at an opposite end.

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49. (Previously Presented) The device of Claim 48, wherein the plurality of hinges taper substantially linearly.

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50. (Previously Presented) The device of Claim 48, wherein each of the plurality of hinges includes a first portion extending along about 1/3 of the length of the hinge and a second portion extending about 2/3 of the length of the hinge, wherein the second portion is tapered.

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51. (Previously Presented) The device of Claim 48, wherein during expansion the hinges experience deformation below their elastic limit.

48 52. (Previously Presented) The device of Claim 48, wherein deformation during expansion is confined to the hinge.

51 53. (Previously Presented) The device of Claim 48, wherein during expansion a structure adjacent the hinges experiences at least two degrees of freedom of motion.

54. (Canceled)

48 55. (Previously Presented) An expandable medical device comprising:  
a plurality of elongated beams;  
a plurality of hinges connecting the plurality of beams together in a substantially cylindrical medical device which is expandable from a cylinder having a first diameter to a cylinder having a second diameter, wherein the plurality of hinges are tapered with the hinge width, hinge length, and taper adjusted to achieve a desired value of the maximum strain along the hinge.

56. (Canceled)

49 57. (Previously Presented) The device of Claim 55, wherein the taper is substantially constant along about 2/3 of a length of the hinges.

48 58. (Previously Presented) The device of Claim 55, wherein the plurality of hinges taper substantially linearly.

48 59. (Previously Presented) The device of Claim 55, wherein each of the plurality of hinges includes a first portion extending along about 1/3 of the length of the hinge and a second portion extending about 2/3 of the length of the hinge, wherein the second portion is tapered.

51 60. (Previously Presented) The device of Claim 55, wherein during expansion the hinges experience deformation below their elastic limit.

48 61. (Previously Presented) The device of Claim 55, wherein deformation during expansion is confined to the hinge.

51 62. (Previously Presented) The device of Claim 55, wherein during expansion a structure adjacent the hinge experiences at least two degrees of freedom of motion.

48 63. (Currently Amended) The device of Claim 55, wherein adjacent elongated beams form V-shapes when the cylinder is at the second diameter and wherein the plurality of hinges are each tapered such that an end of the ductile hinge closer to the apex of the V-shape formed by the adjacent elongated beams has a width which is greater than a width of the hinge at an opposite end.

48 64. (New) The device of Claim 48, wherein the taper is substantially constant along a length of about 2/3 of a length of the hinge.

48 65. (New) The device of Claim 48, wherein the taper extends along a length of about 2/3 of a length of the hinge.

70 66. (New) The device of Claim 48, comprising a pawl disposed adjacent to the hinge and a plurality of teeth adapted to receive the pawl in a locking configuration.

70 67. (New) The device of Claim 66, wherein during expansion, the pawl experiences at least two degrees of freedom of motion.

48 68. (New) The device of Claim 48, wherein the device is laser-cut.

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Hawish 69. (New) The device of Claim 48, wherein the elongated beams further include a plurality of apertures disposed therein and a beneficial agent disposed within the apertures.

103 kr 70. (New) The device of Claim 48, wherein a recoil of the medical device after expansion to the second diameter is less than about eight percent.

70 71. (New) The device of Claim 48, wherein a recoil of the medical device after expansion to the second diameter is less than about five percent.

1) 69 72. (New) The device of Claim 48, wherein the device is manufactured of a biodegradable material.

69 73. (New) The device of Claim 48, wherein the device is manufactured of Nitinol, polymer, or a composite of polymer and Nitinol.

112 48 74. (New) The device of Claim 48, wherein the plurality of elongated beams are connected to the plurality of ductile hinges by transition regions, and the taper in the hinges is between the transition regions.

48 75. (New) The device of Claim 55, wherein the taper extends along a length of about 2/3 of a length of the hinge.

70 x 76. (New) The device of Claim 55, comprising a pawl disposed adjacent to the hinge and a plurality of teeth adapted to receive the pawl in a locking configuration.

70 x 77. (New) The device of Claim 76, wherein during expansion, the pawl experiences at least two degrees of freedom of motion.

48 78. (New) The device of Claim 55, wherein the device is laser-cut.

69 79. (New) The device of Claim 55, wherein the elongated beams further include a plurality of apertures disposed therein and a beneficial agent disposed within the apertures.

70 80. (New) The device of Claim 55, wherein a recoil of the medical device after expansion to the second diameter is less than about eight percent.

70 81. (New) The device of Claim 55, wherein a recoil of the medical device after expansion to the second diameter is less than about five percent.

69 82. (New) The device of Claim 55, wherein the device is manufactured of a biodegradable material.

69 83. (New) The device of Claim 55, wherein the device is manufactured of Nitinol, polymer, or a composite of polymer and Nitinol.

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48 84. (New) The device of Claim 55, wherein the plurality of elongated beams are connected to the plurality of ductile hinges by transition regions, and the taper in the hinges is between the transition regions.

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